2.75 V. The discharge capacity was recorded as a 0.2C capacity B_1.

The charge-discharge cycle practiced above in measuring the 1C capacity, as a unit cycle, was repeated. After 200 charge-discharge cycles, measurement was carried out in the same manner as above to find a 1C capacity A_{200} and a 0.2C capacity B_{200}. A 1C capacity retention A_{200}/A_1 and a 0.2C capacity retention B_{200}/B_1, after 200 cycles, were also found.

The results are shown in Figure 1.

In these results, a larger difference between the 1C and 0.2C capacity retentions indicates a larger decrease of load characteristics after cycles.

As can be seen from comparison between the comparative batteries X1 and X2, the 1C and 0.2C capacity retentions can be both improved by incorporation of a dissimilar element (Al) in the first oxide, i.e., the lithium-manganese complex oxide ($LiMn_2O_4$), in the form of a solid solution. This is because the incorporation of the dissimilar element in the first oxide, in the form of a solid solution, reinforced a crystal structure to the extent that suppressed degradation of the crystal structure with cycling.

From comparison of the comparative batteries X3 - X5 to X1 and X2, it has been found that the 1C and 0.2C capacity retentions can be both improved when $LiMn_2O_4$ is mixed with $LiNi_{0.6}Co_{0.3}Mn_{0.1}O_2$ or $LiNi_{0.8}Co_{0.2}O_2$ than when it is used alone in

the positive electrode, or, when $LiMn_{1.95}Al_{0.05}O_4$ is mixed with $LiNi_{0.8}Co_{0.2}O_2$ than when it is used alone in the positive electrode. This is because the lithium-manganese complex oxide, when combined with the lithium-nickel-cobalt complex oxide, becomes more effective to suppress expansion and shrinkage of the whole of a positive electrode mix with cycling.

As can also be seen from comparison of the present battery A to comparative batteries X3 - X5, the combination of $LiMn_{1.95}Al_{0.05}O_4$ with $LiNi_{0.6}Co_{0.3}Mn_{0.1}O_2$ results not only in the marked improvements of the 1C and 0.2C capacity retentions but also in the marked reduction of a difference between the 1C and 0.2C capacity retentions that suppresses load characteristic deterioration with cycling. This is considered due to the incorporation of a dissimilar element in each of the lithium-manganese complex oxide and lithium-nickel-cobalt complex oxide, in the form of a solid solution, that caused a change in electronic state of the active material, i.e., a combination of the first and second oxides, in such a way to increase electronic conductivity of its entirety, and also caused a change in its expansion-shrinkage behavior with charge-discharge cycling in such a way to maintain stable contact between particles of the first and second oxides during charge-discharge cycles.

In the above examples, the oxide represented by the

compositional formula $LiMn_{1.95}Al_{0.05}O_4$ was used for the first oxide incorporating a dissimilar element in the form of a solid solution. It has been also proved that the same effect can be obtained with the use of a lithium-manganese complex oxide represented by the compositional formula $Li_xMn_{2-y}M1_yO_{4+z}$ (where, M1 is at least one element selected from the group consisting of Al, Co, Ni, Mg and Fe, $0 \leqq x \leqq 1.2$, $0 < y \leqq 0.1$ and $-0.2 \leqq z \leqq 0.2$).

Also in the above examples, the oxide represented by the compositional formula $LiNi_{0.6}Co_{0.3}Mn_{0.1}O_2$ was used for the lithium-nickel-cobalt complex oxide (second oxide) that incorporated a dissimilar element in the form of a solid solution. It has been also proved that the same effect can be obtained with the use of a lithium-nickel-cobalt complex oxide represented by the compositional formula $Li_aM2_bNi_cCo_dO_2$ (where, M2 is at least one element selected from the group consisting of Al, Mn, Mg and Ti, $0 < a < 1.3$, $0.02 \leqq b \leqq 0.3$, $0.02 \leqq d/(c + d) \leqq 0.9$ and $b + c + d = 1$).

EXPERIMENT 2

In this experiment 2, the amounts of the first and second oxides contained in the positive electrode and accordingly their relative contents were varied to compare performance characteristics of the resulting batteries.

The procedure utilized in the preceding example to construct the battery A in accordance with this invention